

# PROCEEDINGS

## AMERICAN SOCIETY OF CIVIL ENGINEERS

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### ORGANIZATION FOR METROPOLITAN TRAFFIC AND TRANSPORTATION PLANNING

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CITY PLANNING DIVISION

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## THIS PAPER

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## ORGANIZATION FOR METROPOLITAN TRAFFIC AND TRANSPORTATION PLANNING

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A survey conducted by the American Institute of Public Opinion in the nation's 14 largest cities revealed that the citizens of these large metropolitan centers consider exasperating traffic jams, time-wasting and ancient transportation and parking headaches second only to the elimination of slums as the most discouraging problems they face today. The relief of traffic congestion in our cities is generally accepted as the number one transportation problem in the country. It is important to emphasize that the above survey revealed not what the experts think but what the people of the city feel about traffic problems.

It is unfortunately still commonplace in many cities that advocates of one particular form of transportation or another suggest that they alone have the solution for the problem. We have all heard the arguments between the proponents of fixed rail rapid transit and those who contend that modern expressways designed for rubber tired vehicles alone offer the greatest hope for a sound solution to the urban transportation problem. Others emphasize the key importance of the commuter railroads in solving the metropolitan transportation problem, and cite the great progress made in the development of single car diesel trains using existing or abandoned railroad rights-of-way. Still others argue that rubber tired rapid transit on the major thoroughfare system offers the greatest hope for an effective and economical solution.

While these arguments continue unabated, an increasing number of traffic engineers, transportation experts and city planners are beginning to recognize that all too little attention has been given to coordinated transportation—and the part which each can properly contribute to the overall solution. In the light of the failure to date to solve our metropolitan transportation problems by piecemeal approaches, and in the face of the increasing severity of these problems, we are forced to accept as the first principle of sound urban traffic and transportation planning that such planning must be both metropolitan in breadth and comprehensive in scope. It must embrace in a single study all forms of transportation in metropolitan areas, including fixed rail rapid transit, commuter railroads, expressways with or without fixed rail transit facilities, major and secondary thoroughfares which serve as collectors and distributors for expressway traffic, and terminal parking facilities, truck terminals and a variety of facilities for interchange between the different forms of transportation.

Fortunately, improvement in traffic and transportation survey techniques has been rapid and far-reaching during recent years. Comprehensive travel studies showing passenger movement by transit, private vehicle, and taxi and truck movements as well have been made in 93 of the larger cities, and less intensive surveys in hundreds of smaller cities. While these origin and destination surveys have been largely standardized, refinement in methods of traffic

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analysis is continuing. However, such surveys relate principally to the movement of vast and increasing quantities of traffic to, in, and through urban areas, but cast little light on the effect of such traffic on the areas through which it moves.

The understandable preoccupation of traffic and transportation engineers with the efficient movement of traffic in urban areas has sometimes blinded them to the effects which their proposed solutions have had on cities generally, or to the failure of traffic palliatives in the face of fundamental urban deficiencies. The traffic engineer's decisions are understandably based first on traffic needs. While the primary responsibility of the traffic engineer is to make provision for the efficient movement of traffic, he must increasingly share with the city planner the responsibility for making cities as places for living more healthful, safe, pleasant and in general more satisfying.

The broad objective of any plan for traffic and transportation must be provision for safe, convenient and efficient movement of people and goods between all parts of the city and region on the one hand and on the other hand the provision of a transportation framework within which can be developed the best possible environment in which to live, work, and play. Recognition by not only the city planner but the traffic engineer as well of the fundamental and inherent conflicts between the efficient movement of people and goods on the one hand and the achievement of safe, attractive and stable urban neighborhoods on the other is the first step in satisfactorily resolving these conflicts. Both city planner and traffic engineer must recognize that there are inherent conflicts between the city as a production machine and the city as a place for living. It is becoming increasingly clear that failure to recognize these conflicts, and our failure as a consequence to resolve or minimize them in the process of building, redeveloping or conserving our cities is one of the major causes of some of the most serious shortcomings and problems with which our cities are now confronted.

Our cities have substantially the same streets they had at the turn of the century, before the advent of the automobile. Adequate for the horse and buggy of fifty years ago, the streets of our central areas have become hopelessly overcrowded. They can no longer handle the traffic on them today. In order to bring about an effective solution to the traffic problem we must first understand why our streets no longer work. The peace, quiet and safety of most of the residential neighborhoods in the central parts of our cities have been destroyed by a blanket of through traffic which moves daily over residential streets as well as major thoroughfares. Family living has become about impossible in many areas. Among the major factors causing deterioration and blight is the inability of families to find a safe and attractive neighborhood environment in these close-in central areas which are cut into narrow ribbons of housing by heavily travelled streets. Many central areas have become little more than funnels through which surges the daily ebb and flow of traffic from outlying areas to the heart of the city.

If city planner and traffic engineer can agree that ever increasing traffic congestion is one of the basic causes of blight around the core of every city, then perhaps they can together establish a sound basis for more effective correlation between transportation planning and land-use planning. One of the greatest needs in the improvement of cities is a clearer understanding of relationships between the two. One need only consider the vast corridor areas of residential land through which traffic pours daily to the center of such cities as Chicago or Detroit, for example, to appreciate the fact that there can be no hope of sound redevelopment nor even of conservation of such areas until the

increasingly heavy volumes of fast through traffic are somehow eliminated from streets originally intended for local neighborhood access only.

Cities are beginning increasingly to recognize the basic nature of the conflict between street traffic which is rapidly approaching a saturation point, and the protection and improvement of the residential, commercial and industrial areas through which this traffic moves. Traffic congestion in urban centers is not only a major cause of deterioration and blight, but is increasingly becoming recognized as a major cause of the exodus of population, and commercial and industrial activity from the central areas of cities to the suburbs. This exodus results basically from the fact that the street pattern of cities generally having developed before the needs of the automobile were recognized or understood is obsolete and inefficient.

Few attempts have yet been made to measure the loss to cities resulting from the stranglehold of traffic on the central areas which are so ill equipped to handle it, nor to determine what part of the total loss in central area values may be ascribed to traffic problems as contrasted with other manifestations of urban deterioration. The assessed valuation of the downtown area of Detroit dropped from 380 million dollars in 1930 to 220 million dollars in 1953, a decrease of almost 42 per cent. During this period the amount of vacant land increased to nearly 46 percent of the total net land area in the downtown area exclusive of streets. Traffic congestion is considered by many to be the principal problem in the downtown area.

The city planner must be concerned not only with the changes which have already occurred in the central cities but even more with those which may be expected to develop as traffic volumes and traffic congestion continue to mount. The volume of automobile traffic has increased in many cities five percent or more each year since the end of World War II, with similar increases anticipated for many years to come. For the country as a whole, estimates for 1963 indicate an increase from the present fifty-three million vehicles to a total of sixty-eight million vehicles or approximately thirty per cent during only a ten year period. American cities must face the staggering problem of how to accommodate the contemplated increase in traffic with greater vision and determination than has been brought to bear on this problem in the past. This notwithstanding the tremendous progress made in planning and construction of urban expressways in most large cities. It is anticipated that many of these expressways will reach a point of saturation soon after being opened for use. If this happens, how can long range relief of traffic congestion on existing streets be expected when overall traffic is expected to increase another thirty per cent or more in the next ten years alone? What may be the situation in another twenty years or thirty years?

The conclusion clearly is that all forces of metropolitan traffic and transportation must be analyzed together and in closer relation to the land use pattern of the entire urban area. The traffic engineer, the highway engineer, the transit expert, the railroad transportation expert, the city planner and the public finance expert must work more closely together, must pool their information more freely, and must go beyond their own limited fields. They must develop more effective cooperative working arrangements—they must together re-evaluate the whole problem of metropolitan traffic, in terms of movement of people and goods into, inside, and through the city and in terms of the impact of various forms of traffic on the area through which it moves.

The city planner faces a basic problem of endeavoring to bring about over the years a functionally better organized and otherwise more rational land use pattern. He should seek to encourage better relationships between places of



residence and places of work; better articulated and balanced distribution of industrial and commercial activities. Such changes in the already built up parts of cities will be at best difficult and slow of accomplishment. All of the existing tools of sound city planning, zoning and subdivision control will be needed and more. Urban redevelopment of those areas already too deteriorated to be maintained in their present obsolete patterns is one of the most promising new tools with which to achieve basic improvements in cities. New programs of urban conservation will bring into sharp focus the problem of maintaining values in urban areas which are often obsolete in general city pattern, but which can be conserved by methods short of complete clearance.

Greater promise for new urban patterns lies in the intelligent direction of new urban growth in those outlying metropolitan areas which are still undeveloped and unspoiled. The city planner's work in the future will require a carefully balanced program giving direction to all three fields—redevelopment, conservation and new growth.

In all of the above areas of city development in the future, no single phase of the metropolitan traffic and transportation problem can be adequately studied unless it is related to the overall problem. Expressways, rapid transit, local surface transit, major and secondary thoroughfares, commuter railroads, truck routes and terminals, parking facilities—all must be analyzed as important and interrelated parts of the comprehensive metropolitan traffic and transportation system. Traffic engineers and city planners must join with finance experts in making careful cost analyses of all recommended expenditures for the relief of traffic congestion in relation to relative benefits to be received from the proposed improvements and extensions of competing forms of traffic.

One of the most challenging problems faced by municipal governments today is the determination of how much public revenue to assign for the improvement of the various competing types of transportation service—expressways, surface transit, rapid transit, major and secondary thoroughfares, and commuter railroad services.

The increasing complexity of the overall metropolitan traffic problem has in most large cities led to the creation of a large number of single purpose agencies, each set up in response to the recognition of the need for solving a particular problem.

Most or all of the following municipal and county agencies, departments and commissions, each concerned with some particular phase of the planning and operations of the overall traffic and transportation system, are common in the major metropolitan areas of this country: street traffic commission, department of streets and traffic, street railway department, rapid transit commission, city plan commission, parking authority, public works department, port authority, bridge and tunnel authority, department of parks and boulevards, metropolitan parkway authority, truck terminal committee, county road commission, and special O-D survey committee. Other agencies having jurisdiction are the budget bureau, the expressway coordinator's office, private bus companies, commuter railroads and private transit companies.

In the face of this multiplicity of local public agencies, each set up to perform certain specific duties under the charter, it is hardly surprising that the efficient coordination of all forms of transportation has become an increasingly complex problem.

Subways have been built parallel to and near expressways which did not include fixed rail transit facilities, at a greater total cost for the two than if a single combined facility had been built. Expressways with downtown terminal parking have threatened doom to transit systems. Commuter railroads often

with well located rights-of-way have curtailed or entirely eliminated service in the face of inroads from the private automobile and competing public transportation routes. Frequently both public and private commuter bus lines parallel commuter rail lines. How such costly and often wasteful competition can be avoided in the future has become a problem of increasing urgency in many metropolitan areas.

It is not unusual for the city planning authority or consultant to urge that the city plan commission be recognized as the coordinating agency for all traffic and transportation planning. It has been a common occurrence for plan commissions with jurisdiction under the city charter over all aspects of the comprehensive plan to step by step surrender major responsibility for traffic and transportation planning to special agencies created because of the failure of existing agencies to meet particular unsolved problems.

Most major cities now have large, efficient, and well established traffic engineering departments with direct responsibility for traffic operations and for traffic planning, as well as street traffic commissions, transit authorities and parking authorities, and city plan commissions charged with responsibility for preparing a comprehensive city plan. One result of the multiplicity of agencies dealing with traffic problems in American cities generally has been the adoption of half-measures or palliatives which have, by taking care of extreme pressures here and there, served to delay real transportation integration. Many of the traffic engineers day-to-day techniques are relieving traffic pressure but are not solving the basic problem.

Another result of the multiplicity of agencies concerned with traffic has been such dissipation of jurisdiction and authority that it is difficult to place responsibility for a program of fully coordinated traffic improvements on any one body.

The only logical conclusion from the situation described above is that if the overall metropolitan traffic and transportation problem is ever to be grappled with effectively, some form of coordinated metropolitan-wide approach to the problem must be developed, which will take equally into account the need for efficient movement of traffic on the one hand, and on the other hand the effect of that traffic movement on the area through which it moves.

Many metropolitan areas have conducted metropolitan origin and destination surveys as the basis for preparation of comprehensive thoroughfare and expressway plans. While coordinating committees have been set up embracing transit agencies as well as street traffic agencies, it has not been uncommon for cities to separate the planning of thoroughfares and expressways from the planning of transit system improvements. A notable exception is the city of San Francisco which in 1948 prepared a broad transportation plan including a plan for a system of trafficways within the city, a comprehensive and balanced system of city wide public transit, terminal facilities for interregional and suburban transit routes, recommendations for improved functional use of the city streets through modernized traffic control; and finally a plan and program for off-street parking facilities. This plan was based on data provided by the Bay Area Metropolitan Traffic Survey and on comprehensive land use and other studies prepared by the City Plan Commission.

The important achievement in the Transportation Plan for San Francisco was the coordination to a high degree of traffic and transportation studies with general city planning studies of population, land use, economic resources and other public improvements. The organization for the transportation planning job included the appointment of an Administrative Transportation Planning Council which in turn was served by a Technical Committee consisting of the

Director of Public Works, the Manager of Utilities, the Deputy Chief of Police and the Director of Planning. This committee was responsible for preparation of a plan for submission to the Administrative Planning Council and finally to the City Plan Commission for consideration and adoption as the Transportation Section of the Master Plan. Coordination of staff studies was shared by the City Engineer and the Director of Planning. A city planning consultant was employed to consider all aspects of the program from the overall planning point of view, relating the sections of the transportation study to one another and to the land use plan, in order to coordinate transportation as a primary element of the Master Plan with the land use and zoning plans. A transit and thoroughfare consultant was employed to prepare detailed studies of transit, motorways, parking, the central area problem and interregional transportation problems.

The comprehensive transportation plan for the City of San Francisco is being supplemented at the present time by a broad study of transportation problems throughout the Bay Area. The above approach is cited as an illustration of the general type of coordinated organization which should be feasible for application to a metropolitan traffic and transportation planning program.

Such a metropolitan planning approach to the coordinated solution of traffic and transportation problems would be vastly improved under some form of consolidated or unified metropolitan organization. One of the most promising recent developments in metropolitan planning has been the establishment of the Metropolitan Council of Toronto, a body having jurisdiction over the central city and twelve surrounding suburbs. This Council, set up in 1953, will establish a Metropolitan Planning Board which will prepare an official plan for the metropolitan planning area, the general scope of which will include land uses, ways of communication, sanitation, greenbelts and park areas, and public transportation. The Toronto Transit Commission will be responsible for public transportation in the metropolitan area.

The metropolitan transportation plan in any major city will be unrealistic if it does not rest on a broad base of city and regional planning studies. On such studies must be based the metropolitan land use plan, the population density and distribution plan, the neighborhood unit plan, the school and recreation facilities plan, the utilities plan and the traffic and transportation plan.

Relationships between types and capacities of traffic facilities and population density and land use patterns must be more specifically analyzed than has been done in the past. Specific population densities required to permit economic construction and operation of different forms of transportation must be more carefully determined. More specific studies are needed on the extent to which traffic congestion and traffic hazards are contributing causes of blight. Research is needed to determine what traffic improvement measures can be applied to the city's conservation areas to protect them from impending blight. Specific methods of measuring the harmful effect of through traffic on residential neighborhoods must be developed. Particular study must be given to the re-establishment of safe and attractive residential neighborhoods in the all too extensive "corridor" areas through which great volumes of automobile traffic pour daily from suburb to downtown center. These are some of the many problems which neither city planner nor traffic engineer working alone can solve.

The city planner must develop more specific methods of measuring the harmful effect of through traffic on residential neighborhoods through which it passes.



The following basic problems require the closest possible collaboration between city planners and traffic engineers working together on a technical committee of a Metropolitan Administrative Transportation Planning Council. Such a committee is a basic element in any effective metropolitan area transportation planning study. Among the basic problems to be considered by such a technical committee are:

- 1) Estimate of over-all traffic demand for a specified period in the future based on estimated future population density and on future pattern of industrial and commercial concentration and major recreation facilities.
- 2) Assignment of a percentage of estimated future traffic demand to each of the competing types of transportation service—expressways, major thoroughfares, surface transit, rapid transit, commuter railroad.
- 3) Correlation of thoroughfare plan with the residential area plan so that the thoroughfare plan will define the pattern of neighborhoods and communities with through traffic diverted around residential neighborhoods.
- 4) Correlation of thoroughfare plan with industrial and commercial land use plan, with particular reference to community shopping centers and planned modern industrial districts.
- 5) Comparison of capacity and future demand on designated major thoroughfares as a basis for recommendations of thoroughfare improvements.
- 6) Assignment, based on trends in transit volume and recommended capacity of major thoroughfares and expressways of a percentage of estimated future overall traffic demand to surface and rapid transit.
- 7) Coordination of local transit routes with major thoroughfare plan and coordination of express transit routes with planned expressways and commuter railroad routes. Recommendation for overall local and express transit systems based on the relationship between the comprehensive plan of residential areas, projected population densities and the need for transit service.
- 8) Determination of the feasibility of street closures in areas which are or will be subject to redevelopment and to selection of alternate routes.
- 9) Determination of street changes required in neighborhood conservation plans and effect of these changes on estimated traffic requirements in the area.
- 10) Location of transfer points between automobiles and public transit facilities and determination of required parking capacities at those points.
- 11) Designation of specific truck routes and truck terminal areas in relation to the commercial and industrial land use plan.
- 12) The location and capacity of off street parking facilities both in the downtown area and in the outlying commercial and industrial centers.

Since the above studies require joint analysis by the traffic engineer and the city planner, a joint staff would be most effective with all phases of the metropolitan traffic and transportation planning problem brought together for review by a technical advisory committee which would in turn report to the Metropolitan Administrative Transportation Planning Council on which would be represented all major traffic and planning agencies in the city and metropolitan region.

Only through the careful collaboration of such a coordinating transportation planning group can the maximum benefit be derived from the information provided by a comprehensive metropolitan origin and destination traffic survey. The result of such a broad approach should be the creation ultimately of safe, convenient and attractive cities and the provision of comfortable, fast and economical transportation for all who live in cities.

# PROCEEDINGS-SEPARATES

The technical papers published in the past year are presented below. Technical-division sponsorship is indicated by an abbreviation at the end of each Separate Number, the symbols referring to: Air Transport (AT), City Planning (CP), Construction (CO), Engineering Mechanics (EM), Highway (HW), Hydraulics (HY), Irrigation and Drainage (IR), Power (PO), Sanitary Engineering (SA), Soil Mechanics and Foundations (SM), Structural (ST), Surveying and Mapping (SU), and Waterways (WW) divisions. For titles and order coupons, refer to the appropriate issue of "Civil Engineering" or write for a cumulative price list.

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c. Discussion of several papers, grouped by Divisions.

d. Presented at the Atlanta (Ga.) Convention of the Society in February, 1954.

e. Presented at the Atlantic City (N.J.) Convention in June, 1954.

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